

= DE 2435337 A1

## PATENT SPECIFICATION

(11)

1 484 517

(21) Application No. 22673/75

(22) Filed 23 May 1975

(19)

(31) Convention Application No. 2 435 337

(32) Filed 23 July 1974 in

(33) Fed. Rep. of Germany (DT)

(44) Complete Specification published 1 Sept. 1977

(51) INT. CL.<sup>2</sup> B65D 55/02

(52) Index at acceptance

B8T 3B 9A



## (54) CHILD-PROOF CLOSURE

(71) We, NOVA-HANDELS AG, a Swiss Company of Josefstrasse 84, CH-8031 Zurich, Switzerland, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to the provision of a child-proof closure.

Closures for containers especially bottles are mass production items which require low cost manufacturing measures. The present invention is intended to provide for such closures in a way that children, according to existing and future legal prescriptions, cannot open these closures, whereas there is only a minimum rise in manufacturing costs.

According to the present invention we provide a child-proof closure for a container comprising a first part formed as a sleeve intended to be fixed in position on the container and a second part formed as a lid adapted to close an upper open end of the sleeve, at least one of the parts of the closure being made of elastically deformable material, the sleeve and lid having interlocking parts which, when the lid is in its closed position interlock with one another so that the sleeve cannot be opened by a simple upward movement of the lid, disengagement of the interlocking parts to permit opening of the lid being effected by squeezing.

Preferably the sleeve and the lid have interlocking parts which, in the closed position, engage at the end of one of the diameters of the parts i.e. an interlocking diameter in such a way, that they disengage when one of the parts is squeezed either along the interlocking diameter or along a force diameter displaced therefrom.

In this specification we refer to diameters and to an oval deformation and these terms have been chosen in order to create simple definitions and also, because very important applications of the invention comprise normally circular closures. This, of course, does not exclude closures which are otherwise shaped, e.g. ovally or polygonally. Due to the fact, that the closure has to be deformed ovally during the operation of opening,

small children do not have access to the contents of the container; primarily, because children below a certain age are unable to exercise movements, the direction of which are not congruent with the direction of opening or to exercise acts, the reason of which they do not yet understand, both simultaneously with the opening operation itself; secondly, because, these children lack the strength to deform the lids properly. The interlocking parts may be placed at both ends of the interlocking diameter and the closure may consist of a sleeve part and a separate screw or push-on lid.

Another possibility is to provide interlocking parts only at one end of the interlocking diameter, the other end of the interlocking diameter bearing a hinge. This design is a one-piece-closure with a hinge action lid.

Depending on the design and the situation of the interlocking parts, there is a multitude of variations in the closure design. Two diametrically opposed examples are, one in which there is a 90° angle between the interlocking diameter and the diameter which receives the deforming force and the other in which the two diameters coincide.

Both examples can be realised by a design representing a closure which is very easy to manufacture. If it is provided with a push-on lid, the sleeve may have two hooks which protrude outwardly and the lid may have corresponding openings, and in order to unlock, the force can be exercised on the lid. In that case, there is preferably an angle of 90° between the interlocking diameter and force diameter. The interlocking diameter increases until the openings get free from the protruding hooks. It is also possible to exercise the force on the sleeve, in which case the force will work on the interlocking diameter itself and consequently, this diameter shrinks until the protruding hooks have left the openings in an inward direction. Hinged closures can be advantageously designed in which case the deforming force does not work exactly on a diameter but on two force radiuses which include an obtuse angle  $2\alpha$ , the resulting force being directed away from the hinge

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FIG. 1.

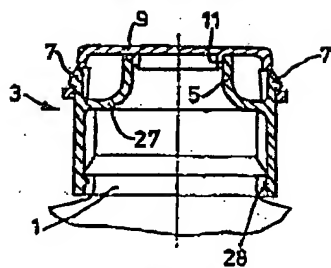


FIG. 3.

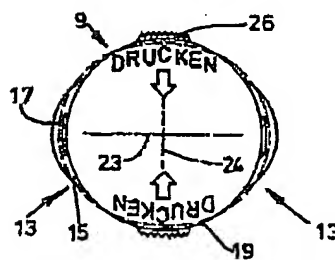


FIG. 2.

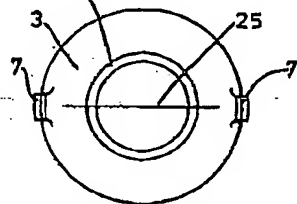


FIG. 4.

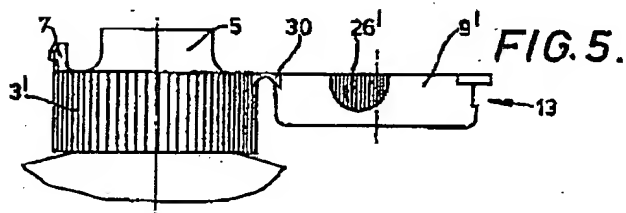
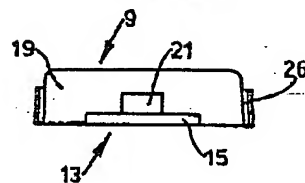
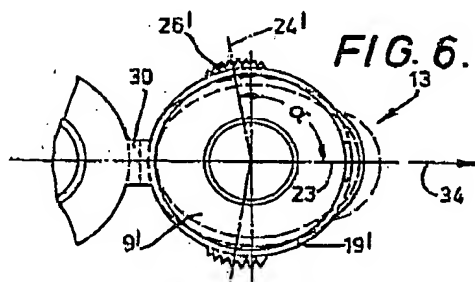


FIG. 6.



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Sheet 2

**FIG. 7.**

